PTO/SB/33 (01-09)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): 05-1094

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Application Number	Filed
10/563,495	1-4-06

First Named Inventor: Malcolm David Macleod

Art Unit	Examiner
3662	Hien Q. Ly

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 32901

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

/A. Blair Hughes/
Signature

A. Blair Hughes
Typed or printed name

312-913-2123
Telephone number

May 11, 2009
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 05-1094)

In the Application of:	)	
	)	
Malcolm David Macleod	)	Examiner: Hien Q. Ly
	)	
Serial No. 10/563,495	)	
	)	Group Art Unit: 3662
Filed: January 4, 2006	)	
	)	Conf. No. 8270
Title: Direction Finding	)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

PRE-APPEAL BRIEF

Pre-appeal brief review is requested for the above-identified patent application.

I. BACKGROUND

Claims 1-20 are pending in the application. Independent claims 9 and 18-19 are allowed. Claims 1-8, 10-17 and 20 stand finally rejected claims for being obvious over Miyoshi (USP 6281840) in view of Schantz (USP 6950064). The claim amendments made in Applicant's April 8, 2009 Reply to the Final Rejection have been entered by the examiner.

The application includes three rejected independent claims – claims 1, 10 and 20. The remaining rejected claims – claims 2-8, and 11-17 depend directly or indirectly upon one of the rejected independent claims.

II. THE OBVIOUSNESS REJECTION TRAVERSE

The Examiner finally rejected claims 1-8, 11-17 and 20 (presumably also claim 10) for obviousness over Miyoshi (USP 6281840) in view of Schantz (USP 6950064). The examiner's obviousness rejection is traversed at least because there is no prima facie case of obviousness and because Miyoshi cannot operably be combined with Schantz.

A. There is No Prima Facie Case of Obviousness

The Examiner has not made out *a prima facie* case of obviousness at least because: (1) Miyoshi fails to disclose determining emitter bearing from antenna signal strengths; and (2) Schantz does not disclose the claim features alleged by the Examiner.

1. Miyoshi does not disclose determining emitter bearings from antenna signal strengths

The cited prior art does not disclose determining emitter bearings from antenna signal strengths. Miyoshi, relied on for this teaching, fails to disclose any feature that resembles determining emitter bearing from antenna signal strengths. Instead, the cited Miyoshi extract - col. 3, line 66 to col. 4, line 8 – discloses selecting transmission antennas based on antenna numbers and received signal strength. This extract provides no disclosure about antenna bearing. Other portions of Miyoshi support this understanding of what Miyoshi actually teaches. (See, e.g., figs 5 and 6 and description in col. 4, line 14 to col. 5, line 45 – disclosing selection of a fig 4 antenna 101 to 104 on the basis of received signal strength - not emitter bearing).

Furthermore, emitter bearing is not of any interest to Miyoshi. In this regard please note Miyoshi column 2 lines 23-27, which states that the first object of Miyoshi is to reduce transmission power requirements by avoiding the use of mixers which cause 50% power loss (Miyoshi at column 2 lines 11-19). This allows amplifiers to be downsized and deterioration associated with transmission diversity to be reduced (column 5, lines 56-60). Neither of these advantages has anything whatsoever to do with emitter bearing.

2. Schantz does not disclose any claim feature

The obviousness rejection is also traversed because Schantz does not disclose the combining and determining steps relied upon in the obviousness rejection. In particular, the obviousness rejection incorrectly states that Schantz discloses:

a) Combining for deriving combined antenna signal strengths by forming combinations of 1st and 2nd antenna signals are *(sic)* in two sets with signals in one set having a non-zero phase difference relative to signals *(sic)* the other set (col. 9-10, lns 55-63); and

b) Determine *(sic)* at least one emitter bearing using the individual and combined antenna signal strengths measured. (col. 10-11, lines 55-34).

The obviousness rejection is technically flawed because it attempts to read into Schantz two elements of Applicant's claimed invention which Schantz does not disclose. Indeed, were

Schantz to disclose "Combining ...etc." as at a) immediately above, Schantz would not work. That is because if one combines two of Schantz's Gaussian doublet signals with different phase, i.e. one upright [+] and one inverted [-] (positive and negative), they cancel one another out completely since they are in antiphase: i.e. one is simply an inverted version of the other. (See fig 3, fig 5 and column 10 lines 8 to 12). Combining two such signals deletes the very information which is essential for Schantz to determine sector of signal arrival.

Turning now to "Determine at least one emitter bearing ... etc." at b) above, the Examiner cites Schantz at column 11, lines 1-12 and lines 28-30. However, this extract makes it clear that Schantz combines signals to allow different weights to be applied to received signals to electronically steer the receiver beam towards unreflected signals and away from reflected (multi-path) signals. Signals are, therefore, not combined in Schantz to identify arrival direction as required by Applicant's independent claims 1, 10 and 20.

Independent claims 1, 10 and 20 were amended during prosecution to emphasise that the at least one emitter bearing is determined from the individual and combined antenna signal strengths measured - not from Schantz's multi-state signal characteristic. Schantz column 9-10, lines 55-63 does not disclose combining signals to identify arrival direction. Instead what is discussed is determining whether signals are upright [+] or inverted [-] to indicate a sector. For example, in fig 3, sectors I to IV are indicated by signals A+B+, A-B+, A-B- and A+B- respectively. Claims 1-8, 11-17 and 20 are non-obvious for the above reasons.

B. The Miyoshi/Schantz Combination Is Not Suggested And Is Inoperable

Schantz discloses ascertaining angle of arrival of an electromagnetic signal having different states on different sides of each of multiple antenna elements. A combination of signal characteristics from different antenna elements then identifies a 90 degree scene sector in which a signal arrives with very poor accuracy of ±45 degrees. It is not obvious to modify Miyoshi to incorporate Schantz as the combination does not work because Miyoshi's signals do not provide the multi-state characteristic which is essential for Schantz to determine an emitter bearing.

Indeed, Miyoshi has no use for signal angle of arrival whatsoever. Instead, one skilled in the art at the time of the invention would understand that Miyoshi only has use for received signal strength, not arrival direction. Since Miyoshi has no use for signal arrival direction, absent the hindsight afforded by reading Applicant's patent specification, Miyoshi cannot motivate one

of ordinary skill in the art at the time the invention was made to carry out a search for a disclosure such as Schantz regarding determination of signal arrival direction.

The Miyoshi/Schantz combination is also technically flawed because the recited Schantz steps, when incorporated into Miyoshi, result in an inoperable combination. Miyoshi uses antennas to detect received signals and determines their strengths irrespective of the nature of those signals. Schantz has use only for a signal which produces different states on different sides of each antenna element. (See *inter alia* Schantz Abstract, col. 7 lines 1-16 and claim 1). This is because Schantz uses combinations of signal characteristics from different antenna elements to determine signal arrival direction, and cannot function without them. (See fig 3 and col. 5 line 60 to col. 6 line 43). Schantz is useful only for determining arrival direction of a prearranged waveform with a multi-state signal characteristic for which the receiving antenna elements have prearranged different responses on different sides. Miyoshi's received signals will not have this signal characteristic, and therefore cannot be used by Schantz. Consequently the combination of Miyoshi and Schantz would not produce an operable result. Therefore independent claims 1, 10 and 20 and their dependent claims are non-obvious for these reasons as well.

C. Many Dependent Claims Are Independently Patentable

Regarding claims 2-3 & 11-12, the Examiner states that Schantz teaches "determining emitter bearing is arranged *(sic)* to derive covariance matrix elements from antenna signal strengths and a relationship between antenna signal strengths and emitter bearing", and cites columns 3-9, lines 65-54 of Schantz in this regard. This is respectfully traversed. The portion of Schantz cited for disclosing this claim feature - cols 3-9, lines 65-54 – has been carefully reviewed, and the expression "covariance matrix" does not appear nor does the term "covariance" or "matrix" or expressions with equivalent meanings.

Regarding claims 2-3 and 11-12, Schantz does not disclose determining emitter bearing from a covariance matrix or a relationship between antenna signal strengths and emitter bearing. Instead Schantz discloses whether signals are upright [+] or inverted [-], and uses this (not antenna signal strengths) to indicate a sector in which a signal arrives. For example, in Schantz fig 3, sectors I to IV are indicated by Gaussian doublet signals A+B+, A-B+, A-B- and A+B- respectively, not by antenna signal strengths. Similar remarks apply to fig 4.

Regarding claims 4-5 and 13-14, Schantz does not teach "the relative phase difference is in the range 30-120 degrees". The obviousness rejection is traversed because Schantz's phase difference in fig 4 is 180° not 30°-120° or 90°. This is because Schantz's Gaussian doublet signals are upright [+] and inverted [-] respectively, so they are in antiphase.

Regarding claims 6 and 15, Schantz does not teach combining antenna signals with equal gain magnitude and with or without equal phase. Indeed, portion of Schantz cited for disclosing this feature – col. 11-12, lines 34-28 - does not teach combining antenna signals with equal gain magnitude and with or without equal phase for the purpose of determining emitter bearing from antenna signal strengths. In this regard, col. 12, lines 4-6 and 9-15, makes it entirely clear that the orientations of Schantz's Gaussian doublet signals (upright [+] or inverted [-]) are used to ascertain a sector in which a signal arrives, and signal amplitudes are used to distinguish unreflected signals from reflected signals. Therefore, Schantz does not disclose determining emitter bearing from signal amplitudes as claimed.

The rejection of claims 7-8 and 17 is traversed at least because Margerum col. 4, lines 6-38 is silent regarding switchable phase shifting, and instead is directed to switching signals. Margerum col. 3 lines 11-68 mentions hybrid junctions 20 and 44 which phase shift by 90° and 180° respectively, but they are not switchable into and out of an antenna signal path. Switching merely selects one of two hybrid junction outputs. Thus, the Miyoshi/Schantz/Margerum combination fails to disclose this claim feature because: (1) Miyoshi/Schantz does not anticipate claim 1 from which claim 7 depends; (2) Miyoshi does not use phase shifting and provides no motivation to search for it; and (3) Margerum does not teach switchable phase shifting.

The examiner alleges, regarding claim 8, that "Margerum teaches that the combining incorporates an adder having two inputs both switch-ably *(sic)* connected to individual signal paths extending to respective antennas". This examiner's characterization of Margerum is wrong. The cited Margerum excerpt, col. 6, lines 45-51 discloses a phase detector 60 and a computer 66, but not an adder with inputs switchably connected to antenna signal paths.

Date: May 11, 2009

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